



Marijuana in Iowa

Emerging Trends...

the Rest of the Story

Iowa Office of Drug Control Policy
September 2016



What We Know...So Far

Does Marijuana have Helpful Properties?

Possibly. Research indicates particular derivatives of marijuana (e.g., CBD) may help provide relief to some lowans with certain conditions.

Does Marijuana have Hurtful Properties?

Yes. Studies show the use of marijuana (i.e., THC) can cause negative health effects & result in impairment, abuse & addiction. Prevention is important.

What's the Truth?

Stay tuned. Scientific study, including clinical trials of potential new medicines, continues at an increasingly rapid pace to get more answers.

Language is Important

Marijuana or Cannabis:

Dried leaves, flowers, stems & seeds from the plant, Cannabis sativa.

Cannabinoids:

Chemical compounds found in marijuana. Scientists say marijuana consists of more than 100 cannabinoids (& over 500 chemicals in total).

Cannabinoid Receptors:

Brain neuron molecules to which cannabinoids attach, disrupting mental & physical functions (memory, coordination, concentration, etc.).

Cannabidiol (CBD):

One non-psychoactive marijuana compound that may have medical value without affecting the mind or behavior.

Delta-9-tetrahydrocannabinol (THC):

Marijuana's main psychoactive/mind-altering compound that may also have therapeutic value.

Distinction with a Difference

Cannabis-Based Medicine:

Cannabis derivatives that test safe & effective as research-based medicines for use by health care professionals in treating patients with valid medical needs, & regulated to reduce public safety risks.

Medical Marijuana:

Differing forms of cannabis approved by legislative or popular vote in some states for treating various health conditions, with fewer controls & safeguards than FDA-approved medicines.

Iowa Law:

Permits regulated use of limited quantities of CBD oil to treat qualified patients with intractable epilepsy.

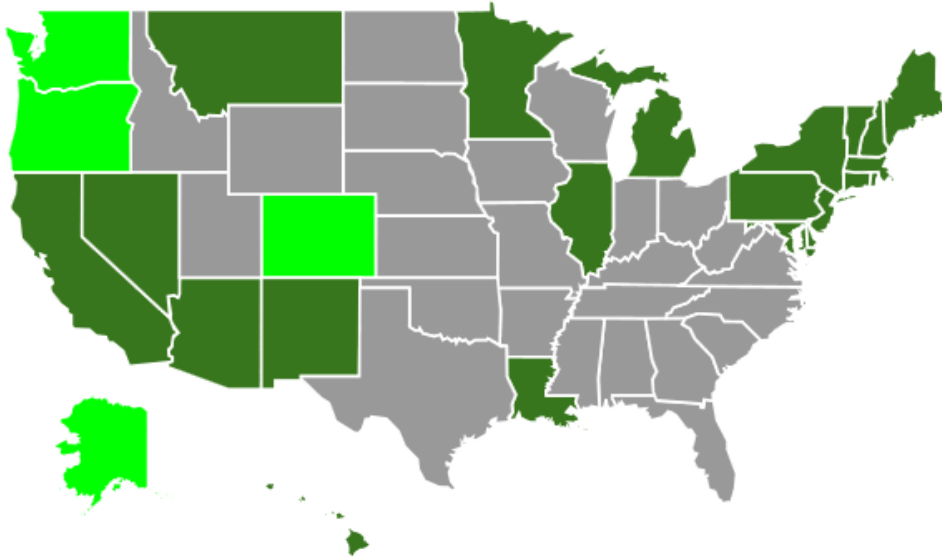
Examples of Plant Derivatives

Drug/Medicine	Plant Source	Use
Aspirin	Willow	Fever & Pain
Atropine	Belladonna Plant	Pupil Dilator in Eye Exams
Digitalin	Foxglove	Heart Medication
Menthol	Eucalyptus Tree	Cough Medicine Ingredient
Morphine	Opium Poppy	Pain Reliever
Quinine	Quinine Tree	Malaria Preventive
Reserpine	Snakeroot	Hypertension
Taxol	Pacific Yew	Ovarian Cancer Drug
Tubocurarine	Curare Tree	Surgical Muscle Relaxant
Vinblastine	Periwinkle	Hodgkin's Disease
Vincristine	Periwinkle	Leukemia Drug
Cannabidiol (CBD)?	Cannabis Plant	Seizure Control...(TBD)?

2001 Scientific American

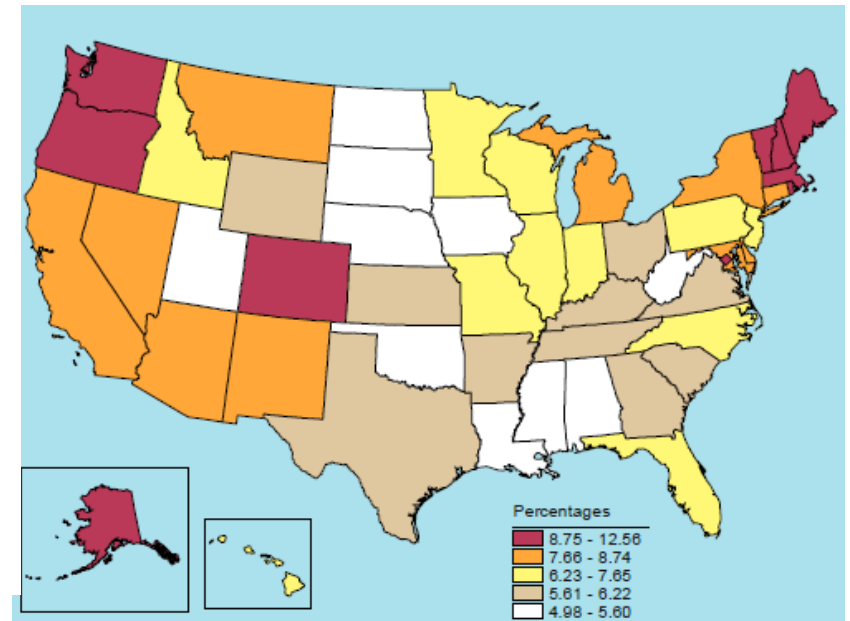
by State

(2016 Governing.com)



- Olive = “Medical” marijuana (*25 & DC). [OH June 2016]
- Lime = “Medical” & “Recreational” marijuana (4).
- Not Shown: Low THC non-psychoactive “CBD” oils (18, including Iowa, where the Pharmacy Board recommended in 2015 the Legislature consider rescheduling CBD only).

(2013-2014 NSDUH)



Scientific Positions on Marijuana

- The FDA has not approved the use of marijuana as medicine, saying “there is currently sound evidence that smoked marijuana is harmful.”
- The Institute of Medicine has declared smoking marijuana is unsafe, & “marijuana is not modern medicine.”
- The National Institute on Drug Abuse reports “marijuana is addictive,” with nearly 4.5 million Americans meeting the clinical criteria for marijuana abuse or dependence.

Health Group Positions on Marijuana

- Major public health organizations (American Cancer Society, American Glaucoma Foundation, American Medical Association, American Psychiatric Association, National Pain Foundation, National Multiple Sclerosis Society, National Association of School Nurses, et al.) do not support smoked marijuana.



- The American Academy of Pediatrics “opposes marijuana use by children & adolescents...the use of ‘medical’ marijuana outside the regulatory process of the FDA...&...legalization of marijuana.”
- The American Epilepsy Society supports rapidly advancing research, saying marijuana “should be studied using the well-founded research methods that all other effective treatments for epilepsy have undergone.”

Marijuana Health Effects

- Marijuana can: cause breathing problems; impair body movement & memory; alter moods & senses; elevate heart rates; cause difficulty thinking & problem solving; cause temporary hallucinations or paranoia; & worsen schizophrenic symptoms. It's also linked to: depression; anxiety; teen suicidal thoughts; & when used by pregnant moms, brain & behavioral problems in babies. Studies suggest moderate THC amounts can be excreted into breast milk.
2016 National Institute on Drug Abuse
- Marijuana can be addictive. 30% of users may develop some degree of problem use, which can lead to dependence or in severe cases, addiction. About 9% of users become dependent, rising to 17% in those who start as teens. Marijuana users also report lower life satisfaction, poorer mental health, poorer physical health & more relationship problems. 2016 National Institute on Drug Abuse

Marijuana Health Effects

- More U.S. citizens met the American Psychiatric Association's diagnostic criteria for marijuana abuse/dependence than for pain relievers, cocaine, tranquilizers, hallucinogens & heroin combined.

2011 U.S. Substance Abuse & Mental Health Services Administration, National Survey on Drug Use & Health

- Blood vessels in rats took at least 3 times longer to recover function after only 1 minute of breathing 2nd-hand marijuana smoke vs. 2nd-hand tobacco smoke. The arteries of rats & humans are similar in this response. Temporary effects from 2nd-hand marijuana smoke could become long-term problems if exposure occurs often enough.

2016 Journal of the American Heart Association/American Stroke Association

- People who abuse or are dependent on marijuana are 3 times more likely to abuse or be dependent on heroin.

2015 Centers for Disease Control



Marijuana/Cannabis a.k.a.

Then

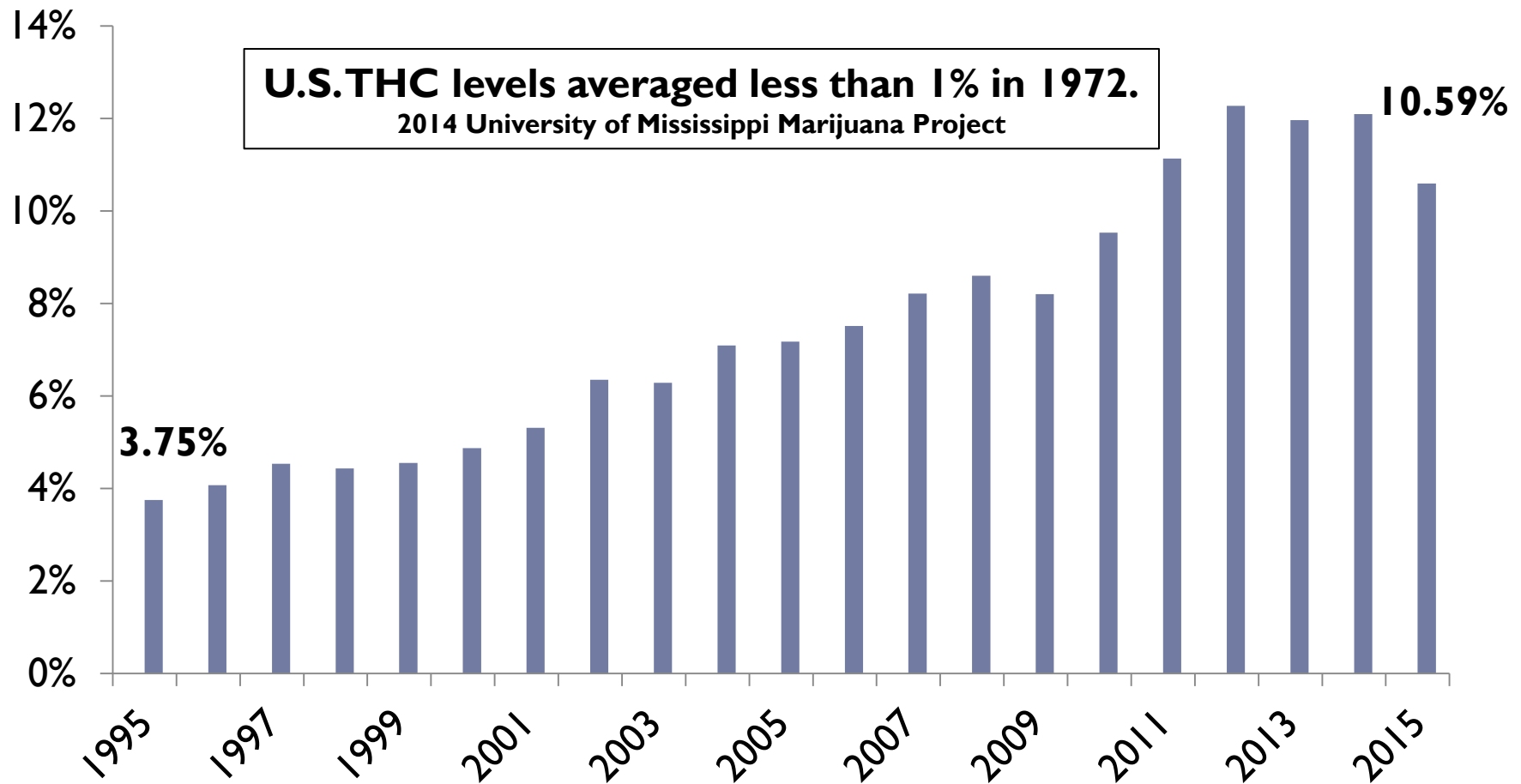
- ▶ Weed
- ▶ Grass
- ▶ Pot
- ▶ Reefer
- ▶ Hash
- ▶ Hemp
- ▶ Joints
- ▶ Blunts
- ▶ Buds

Now

- ▶ Hash or Honey Oil
- ▶ Wax or Earwax
- ▶ Budder
- ▶ Crumble
- ▶ Shatter
- ▶ Black Glass
- ▶ Edibles
- ▶ Reggie
- ▶ Loud

Marijuana's Increasing THC Potency

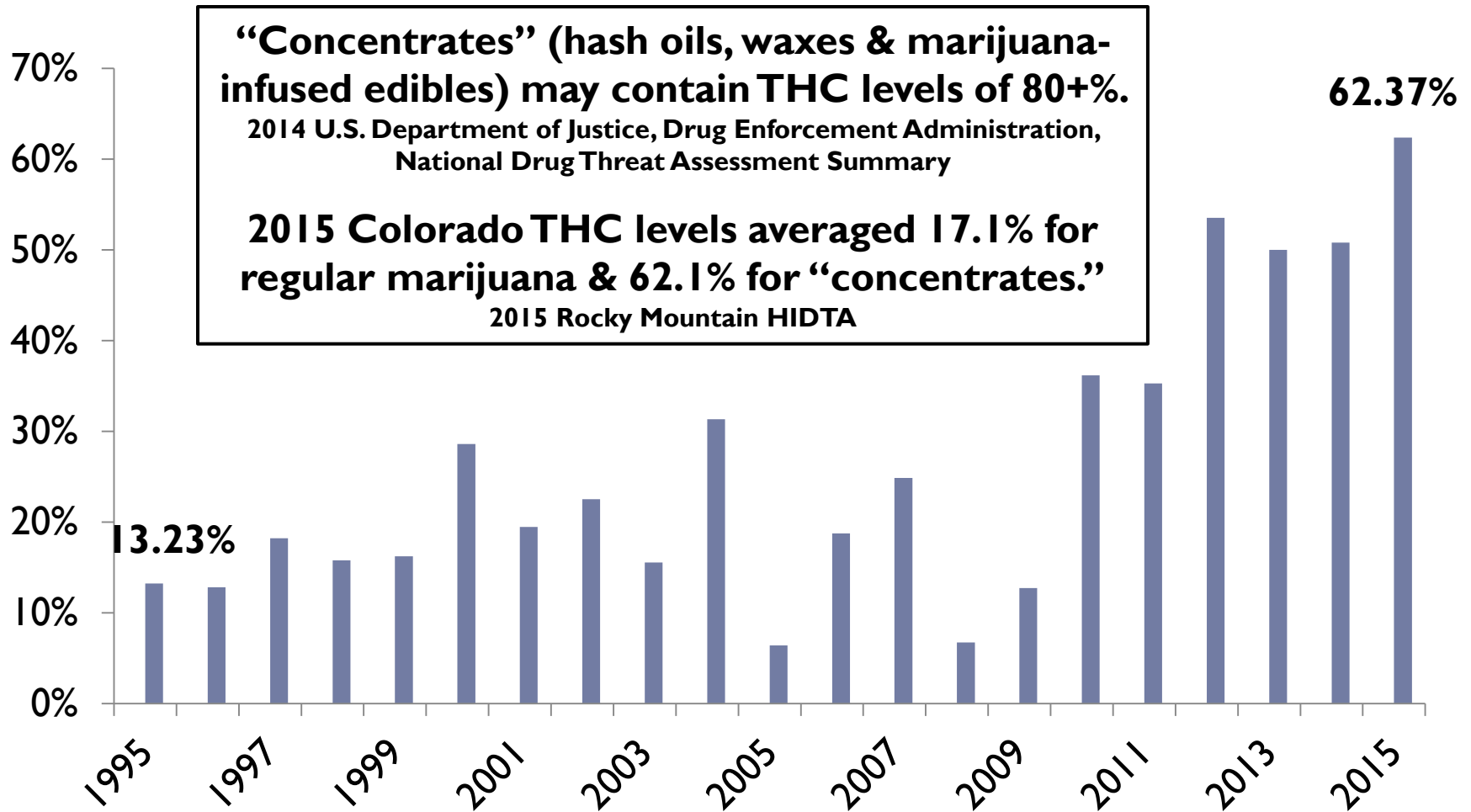
Plant Material ("Weed") Seized in U.S.



University of Mississippi Marijuana Project, through 6-22-16

New Marijuana's Rising THC Potency

Hash Oil Seized in U.S.



University of Mississippi Marijuana Project, through 6-22-16

Concentrates

Beyond the Plant...



"Green Crack" wax



"Ear Wax"



Butane Hash Oil
(BHO)



Hash Oil Capsules



"Budder"



"Shatter"

Concentrates

Beyond the Plant...

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Marijuana “Concentrates”



Hash Oil (aka: honey oil or 7:10)

THC is chemically extracted from the cannabis plant with a solvent to produce a thick amber or brown colored viscous liquid. About one or two drops equals one “joint.” Hash oils are often used in electronic smoking devices for vaping that is smokeless & odorless.

Estimated THC Content = 40-80%



Marijuana “Concentrates”



Wax
(aka: budder, crumble, earwax)

Whipping hash oil during the THC extraction process thickens the product to create marijuana wax. It has a consistency similar to earwax, thus its name. “Dabbing” is inhaling vapor from wax on a heated surface.

Estimated THC Content = 50-80%



Marijuana “Concentrates”



Shatter

Building upon the THC extraction process used for hash oil, shatter is created in multiple steps that include use of a pressure vacuum. The result is an amber or yellow colored thin & brittle cake-like product with an even higher THC content.

Estimated THC Content = 80-90% or higher

Marijuana “Concentrates”



Edibles

Highly concentrated THC-infused food products with delayed effects on unsuspecting users—particularly children drawn to product packaging—can lead to psychotic episodes & other dangers.

THC estimate: 50% or higher



Marijuana “Concentrates”



BHO Labs (Butane Hash Oil)

One way to extract THC from the marijuana plant is with a Butane Hash Oil (BHO) lab, which involves the use of the flammable solvent butane. One byproduct is lab-related explosions, fires & personal injuries...including in Iowa.

Marijuana “Concentrates”

Regular daily users of high-potency marijuana (~16% THC), similar to forms found in the U.S., are 5 times more likely than non-users to have a psychotic disorder. Weekend users are 3 times as likely to suffer psychosis.

2015 Lancet Psychiatry, Kings College London



“2 deaths connected with edible marijuana products have Colorado lawmakers scrambling to toughen regulations & experts warning of bizarre behavior as consumers eat powerful pot-infused foods.”

May 8, 2014 USA Today

The self-inflicted shooting death of a 22-year old on a family ski trip is blamed on 4 marijuana gummy bears.

March 26, 2015 Denver Post

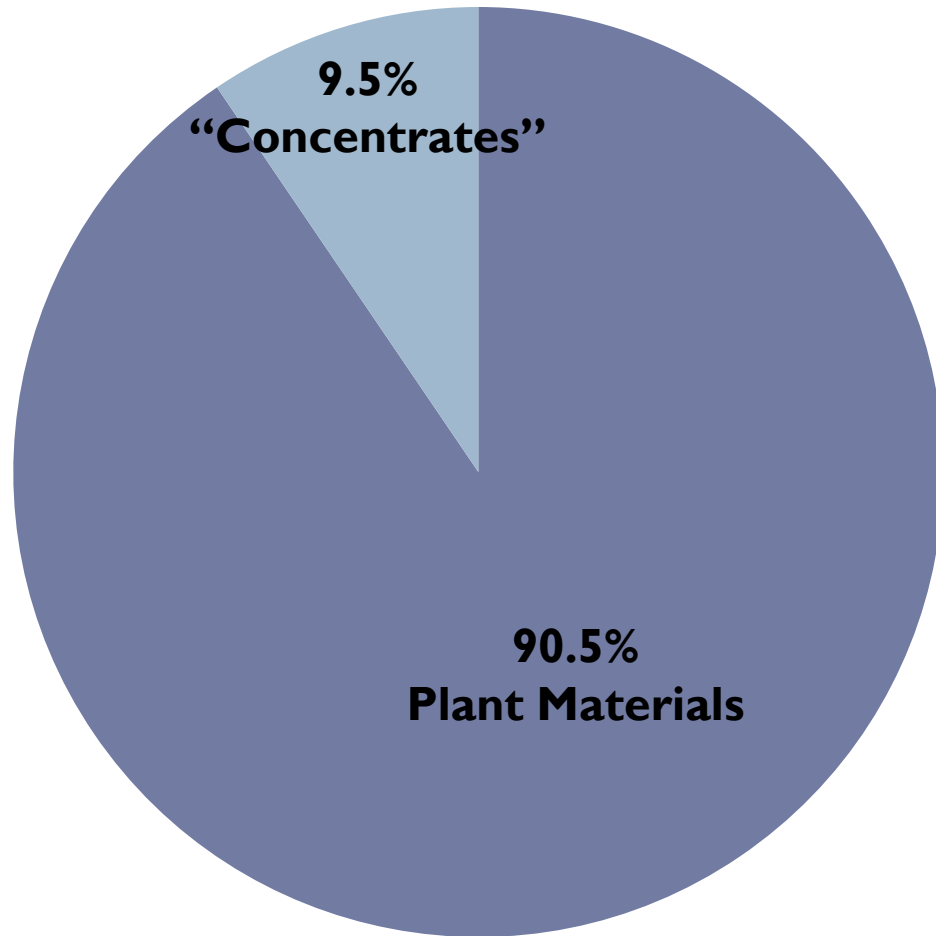


26.5% of teenage marijuana & e-cigarette users report using electronic devices to vaporize more potent marijuana & hash oil.

September 2015 Yale University, Pediatrics Journal

New Marijuana in Iowa

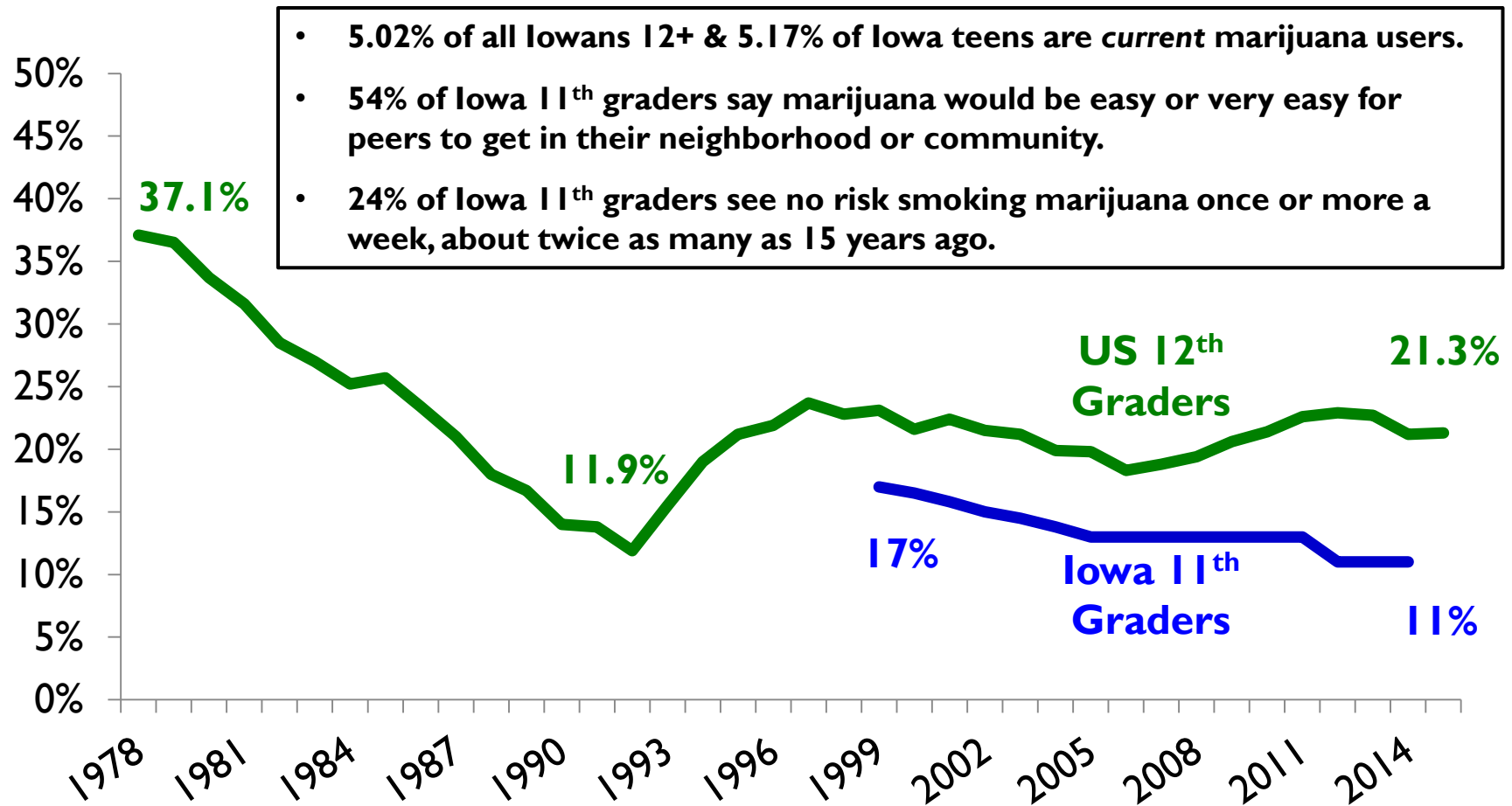
Approximately 9.5% of all 2015 marijuana samples submitted to the Iowa crime lab involved marijuana “preparations,” or “concentrates” (e.g., hash oils, waxes & marijuana-infused edibles).



2015 Iowa Department of Public Safety, Division of Criminal Investigation

Current Youth Marijuana Use

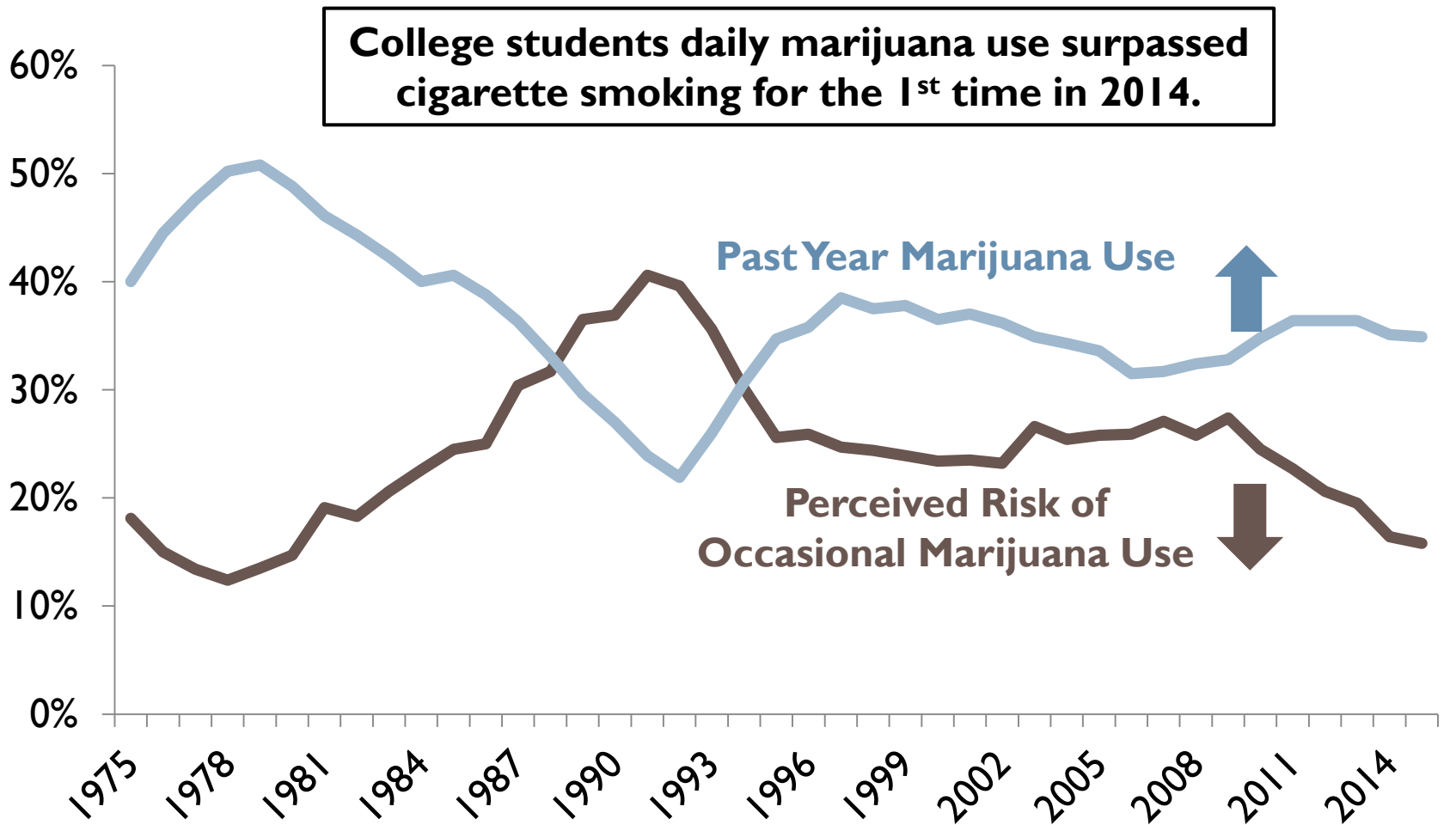
Past 30 Days: Iowa vs. U.S.



2015 Monitoring the Future Survey & 2014 Iowa Youth Survey

Youth Marijuana Attitudes vs. Use

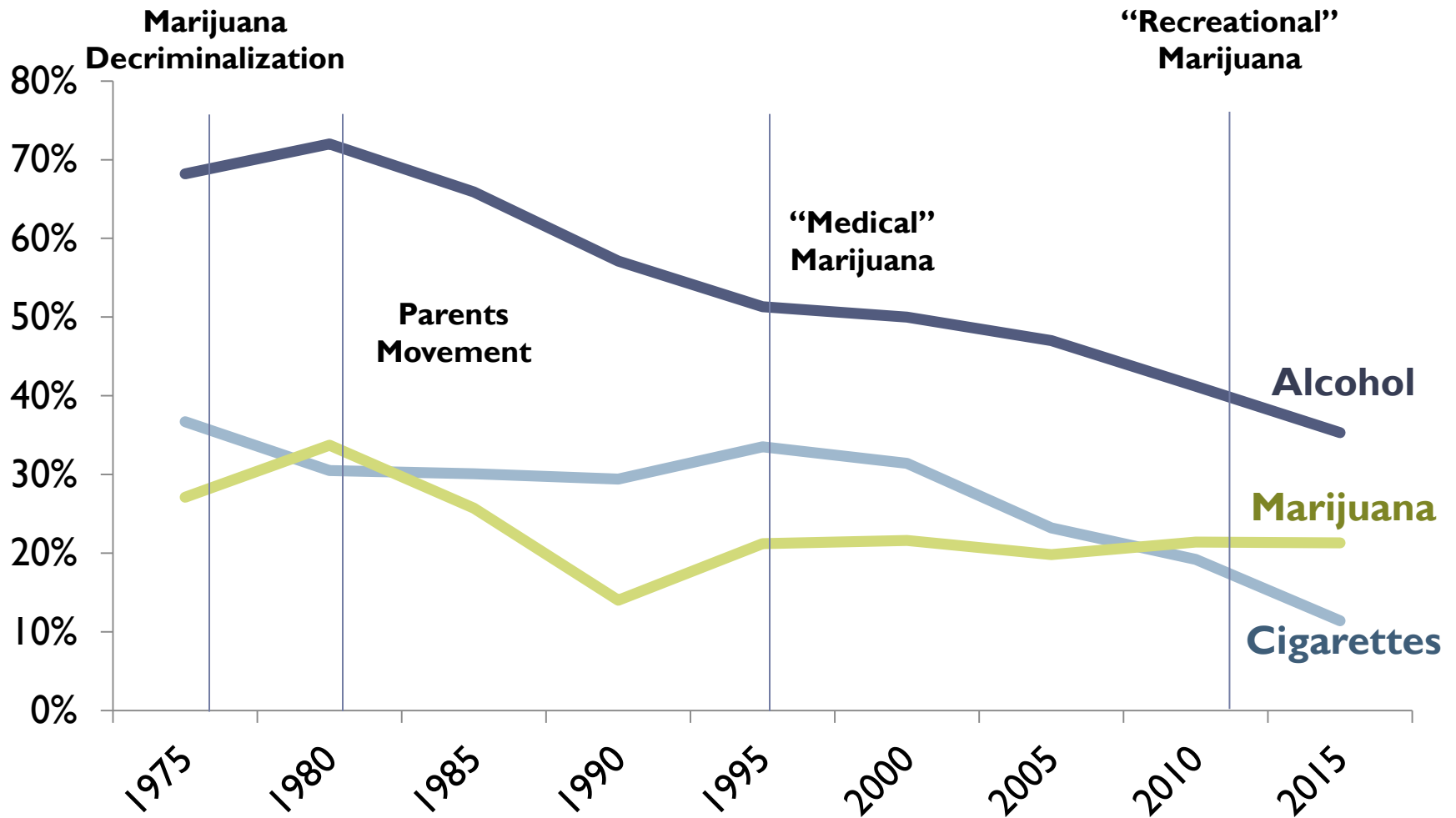
Among U.S. 12th Graders



Monitoring the Future Survey, 2015

Youth Substance Use 40-Year Trends

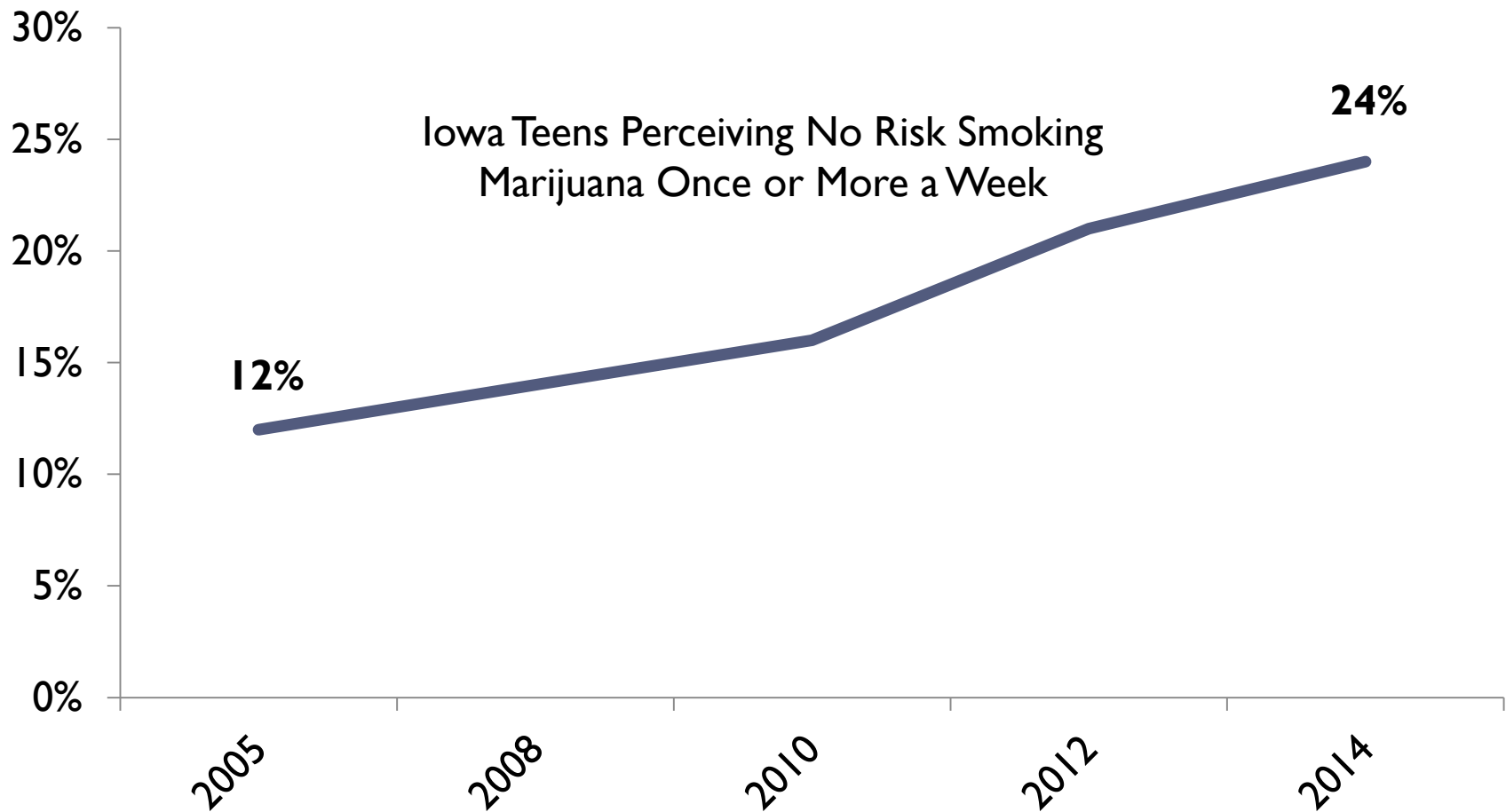
Current Use (past 30 days) Among U.S. 12th Graders



Monitoring the Future, 1975-2015

Iowa Youth Marijuana Attitudes

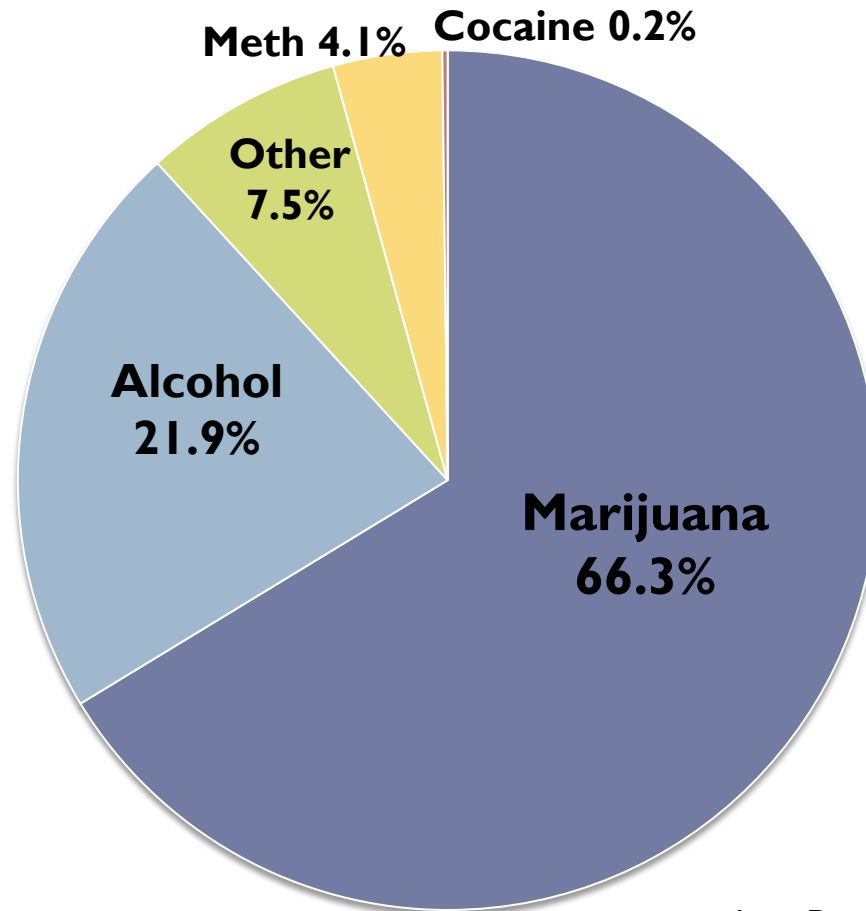
Among Iowa 11th Graders



Iowa Youth Survey, 2014

Drugs of Choice: Iowa Youth

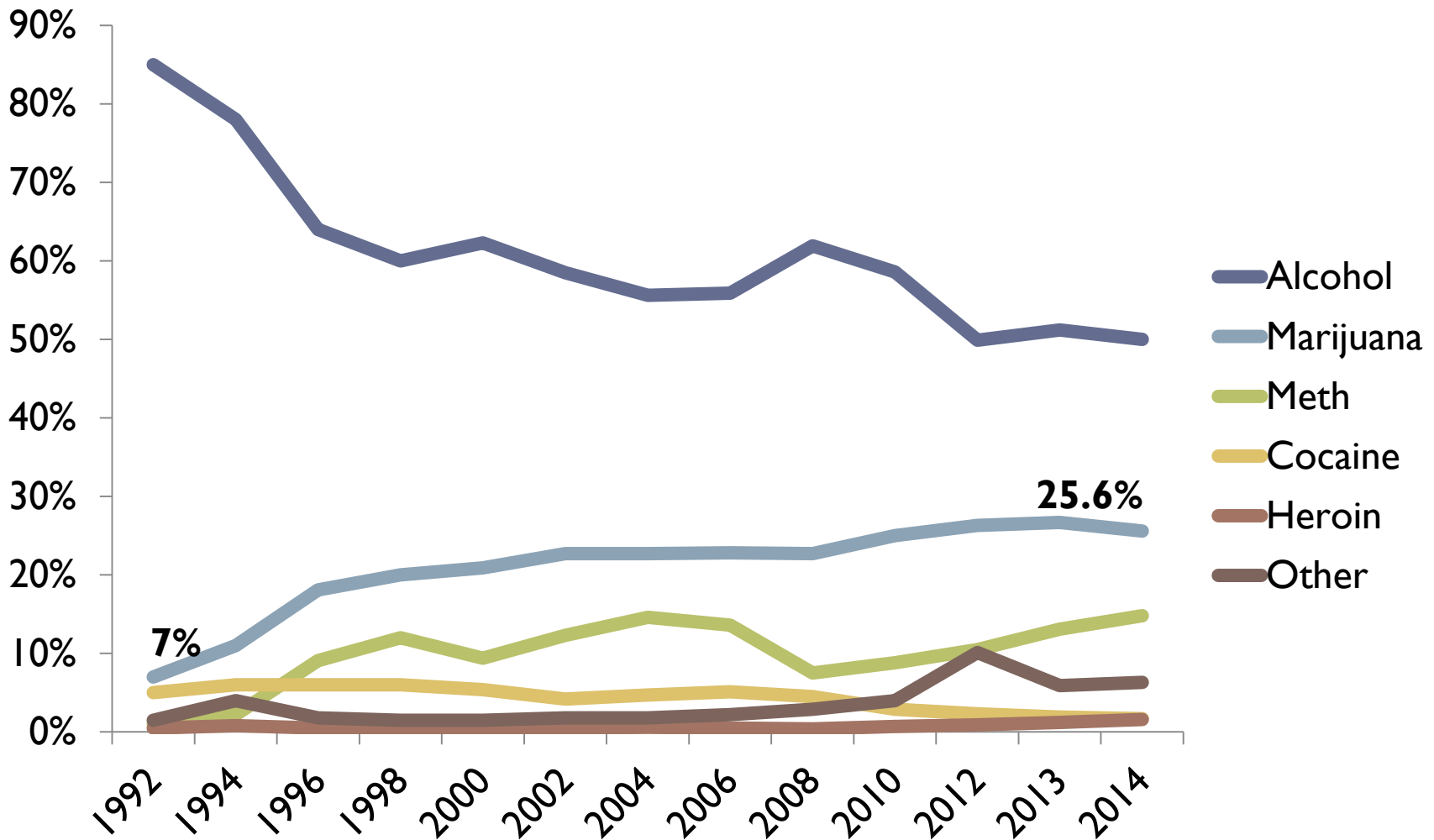
Primary Substance for 5,026 Juveniles in Treatment



Iowa Department of Public Health, 2014

Drugs of Choice: All Iowans

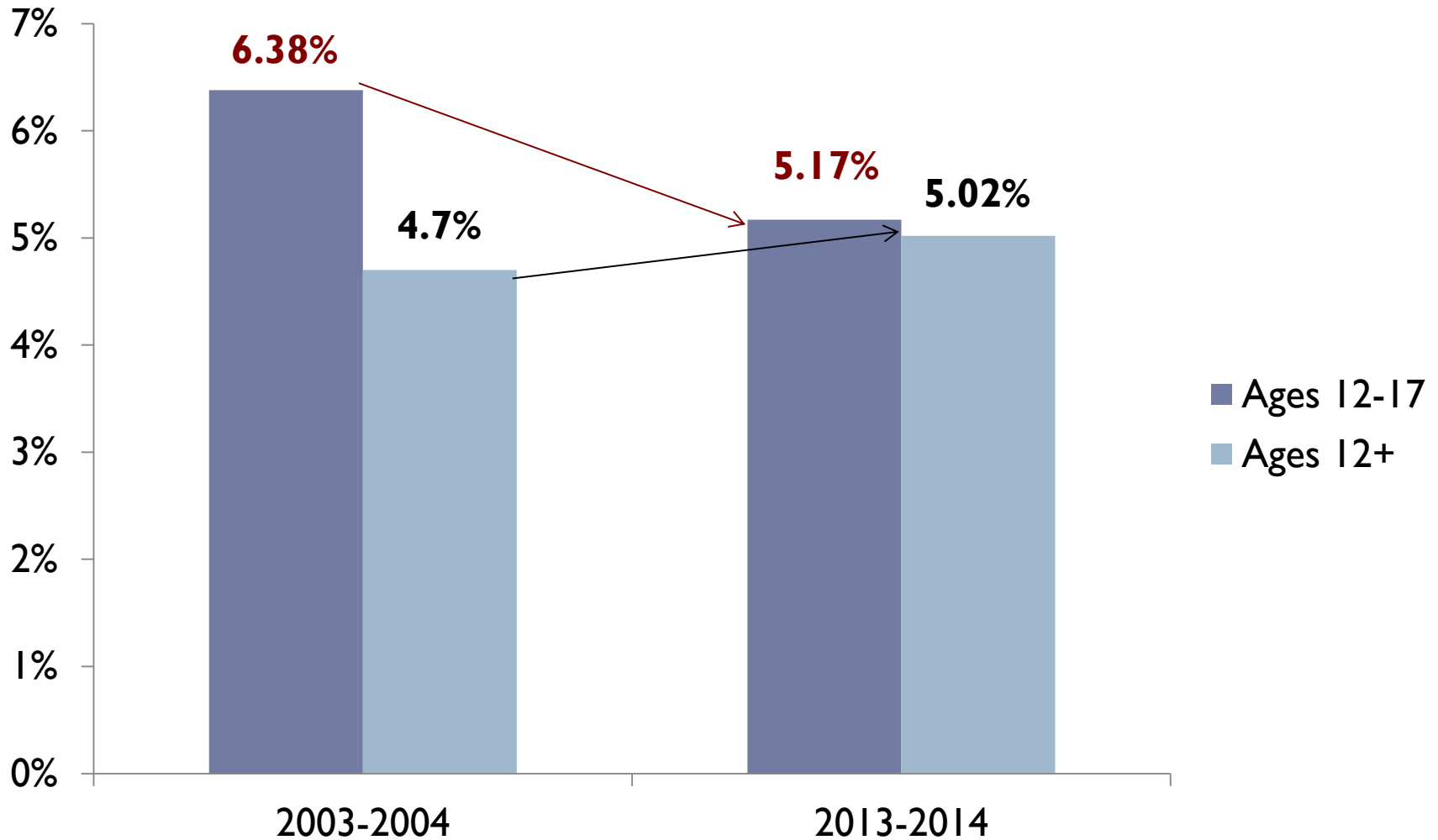
Primary Substance of Choice by Iowans in Treatment



Iowa Department of Public Health, 2014

Marijuana Use in Iowa

Past 30-Days: Pre-Teens & Teens vs. All Iowans

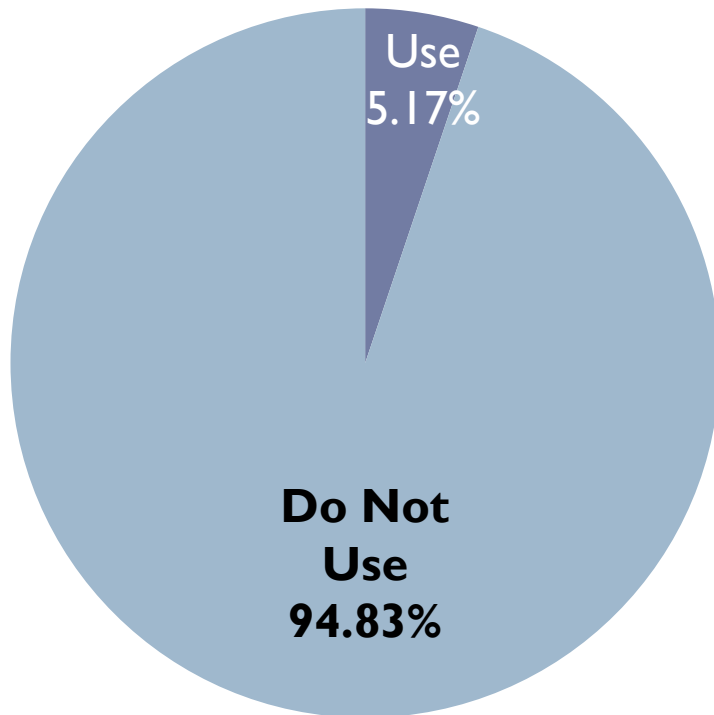


National Survey on Drug Use & Health,

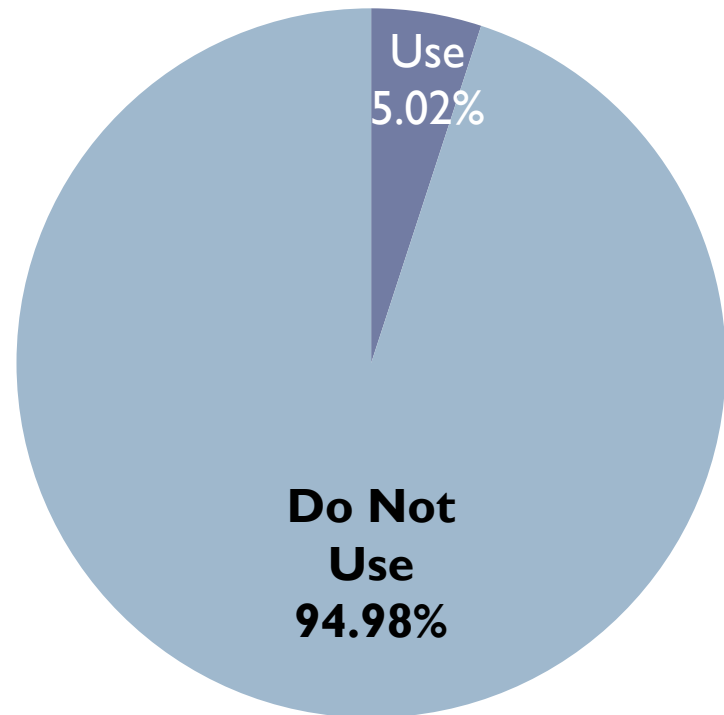
Iowans' *Current* Marijuana Use

Most Iowans are not *current* marijuana users (past 30 days).

**Iowa Youth 12-17 years old
currently using marijuana.**

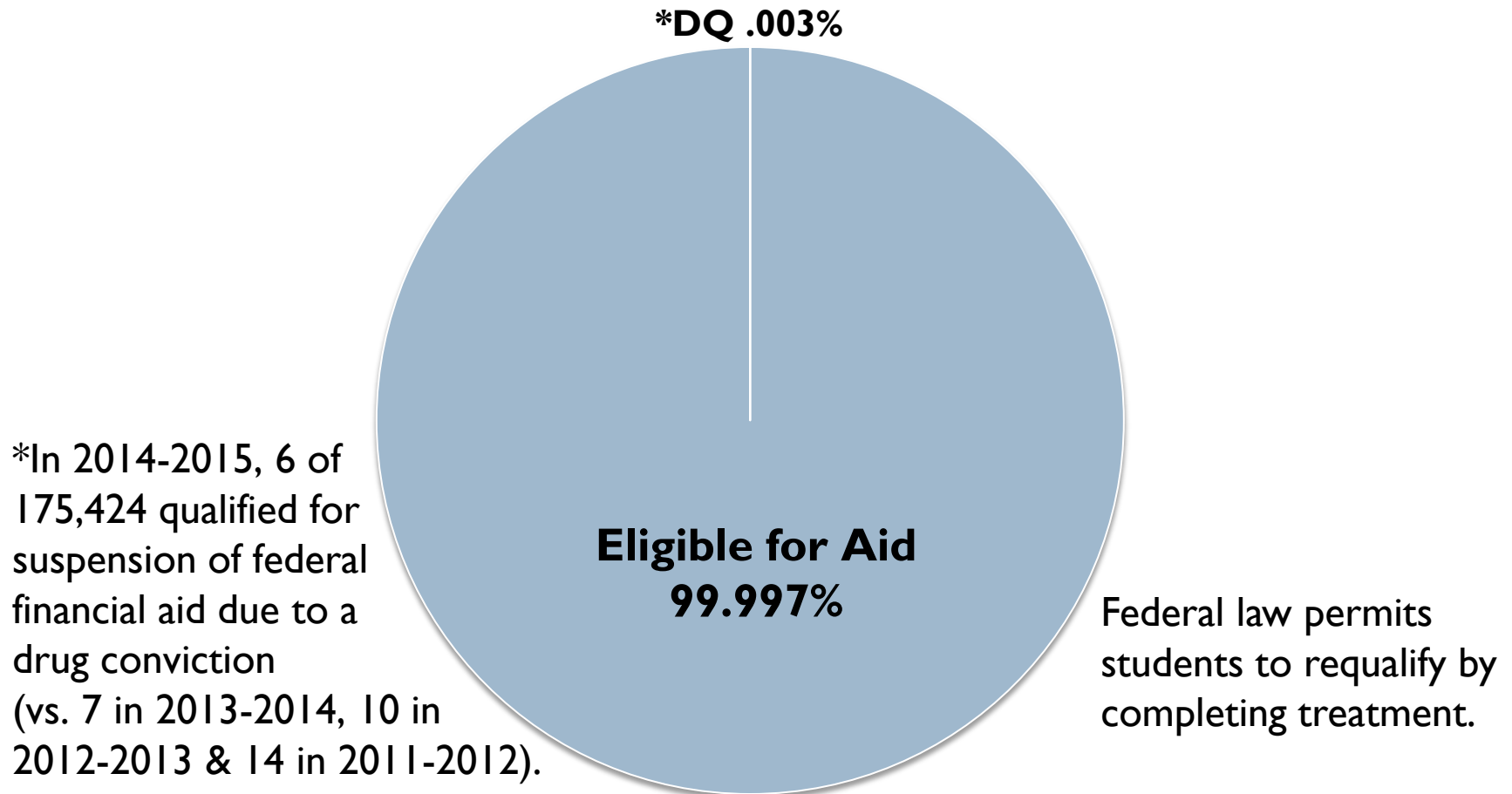


**Iowans 12 & older
currently using marijuana.**



2013-2014 National Survey on Drug Use & Health

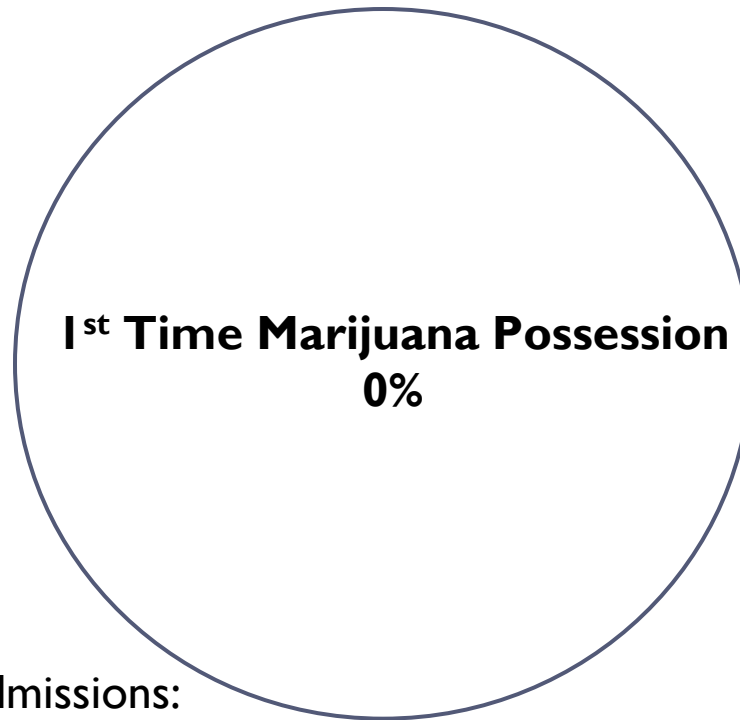
Iowa College Students Risking Aid Due to Drug Conviction



Iowa College Student Aid Commission, 2015

2015 Iowa Prison Admissions

1st Time Marijuana Possession Most Serious Offense



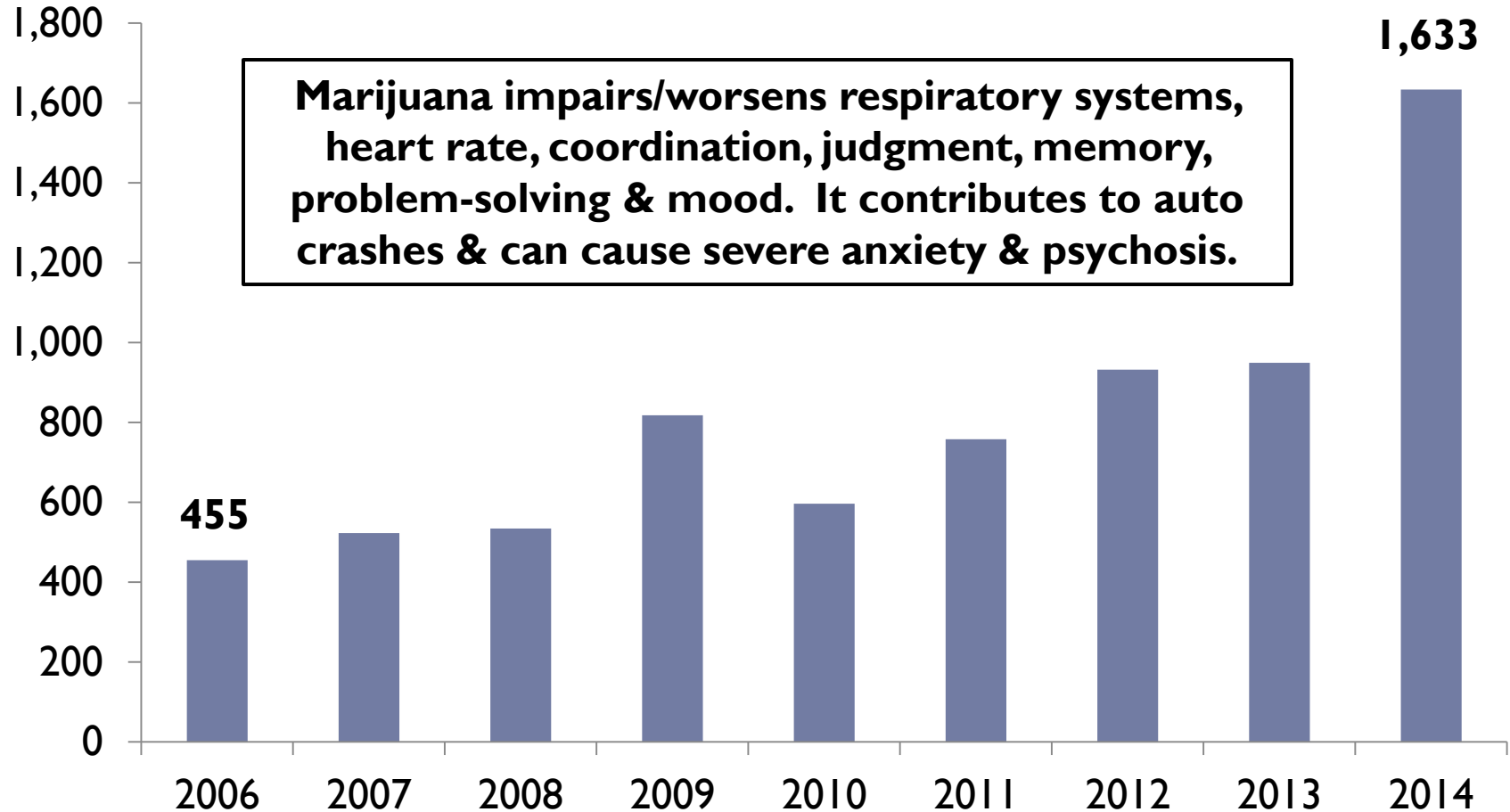
Of 3,842 total prison admissions:

- 130 (3.4%) were for marijuana trafficking (manufacturing delivery, intent to deliver & conspiracy)
- 50 (1.3%) were for 3rd or subsequent marijuana possession,
- 3 (0.08%) was for 2nd or subsequent marijuana possession, and
- None (0%) was for 1st-time marijuana possession.

Iowa Department of Corrections + Division of Criminal & Juvenile Justice Planning, 2015

Iowa Marijuana ER Visits

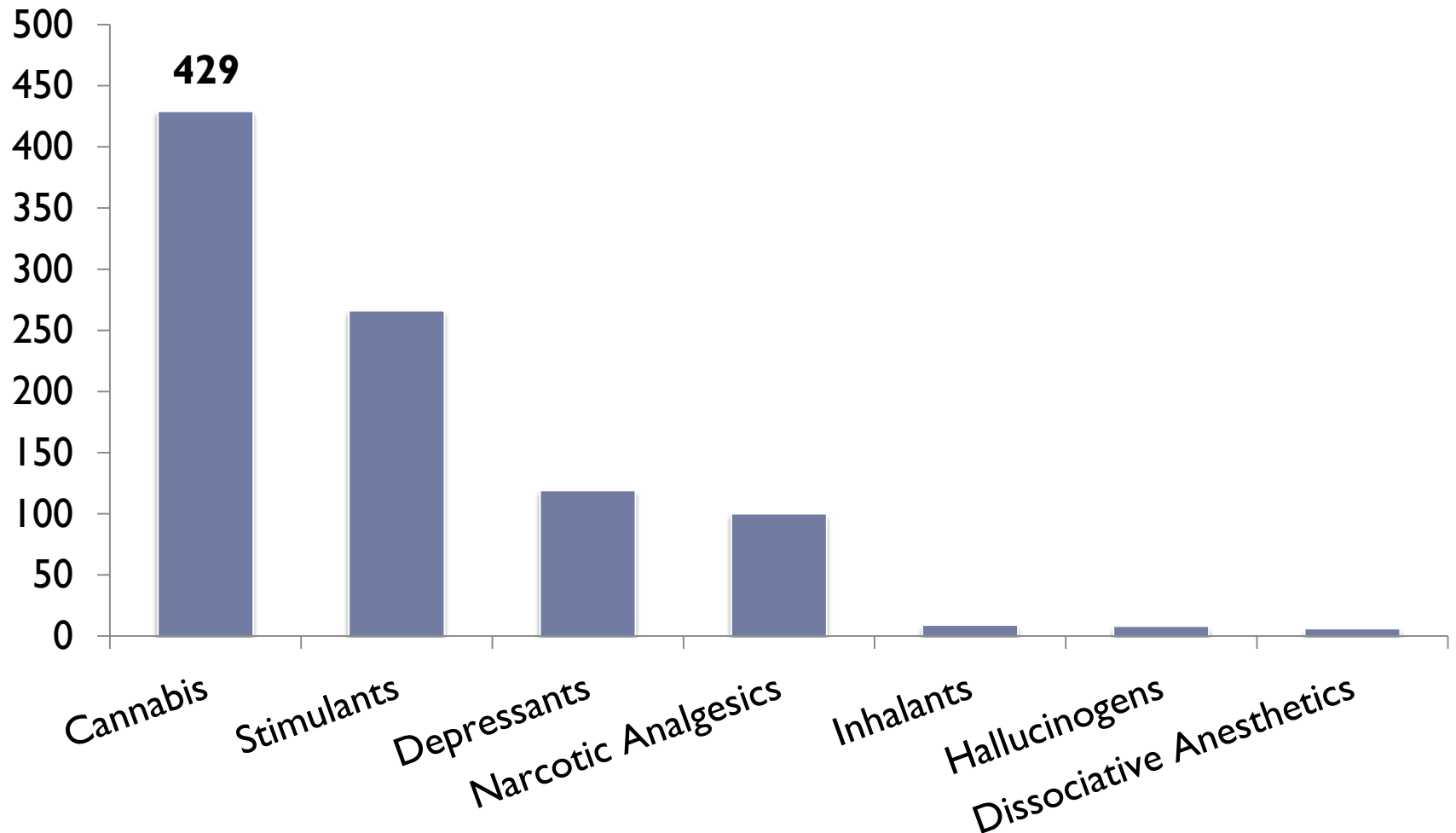
Cannabis Use as Causal or Contributing Factor



Iowa Department of Public Health, 2014

Iowa Drug-Impaired Driving

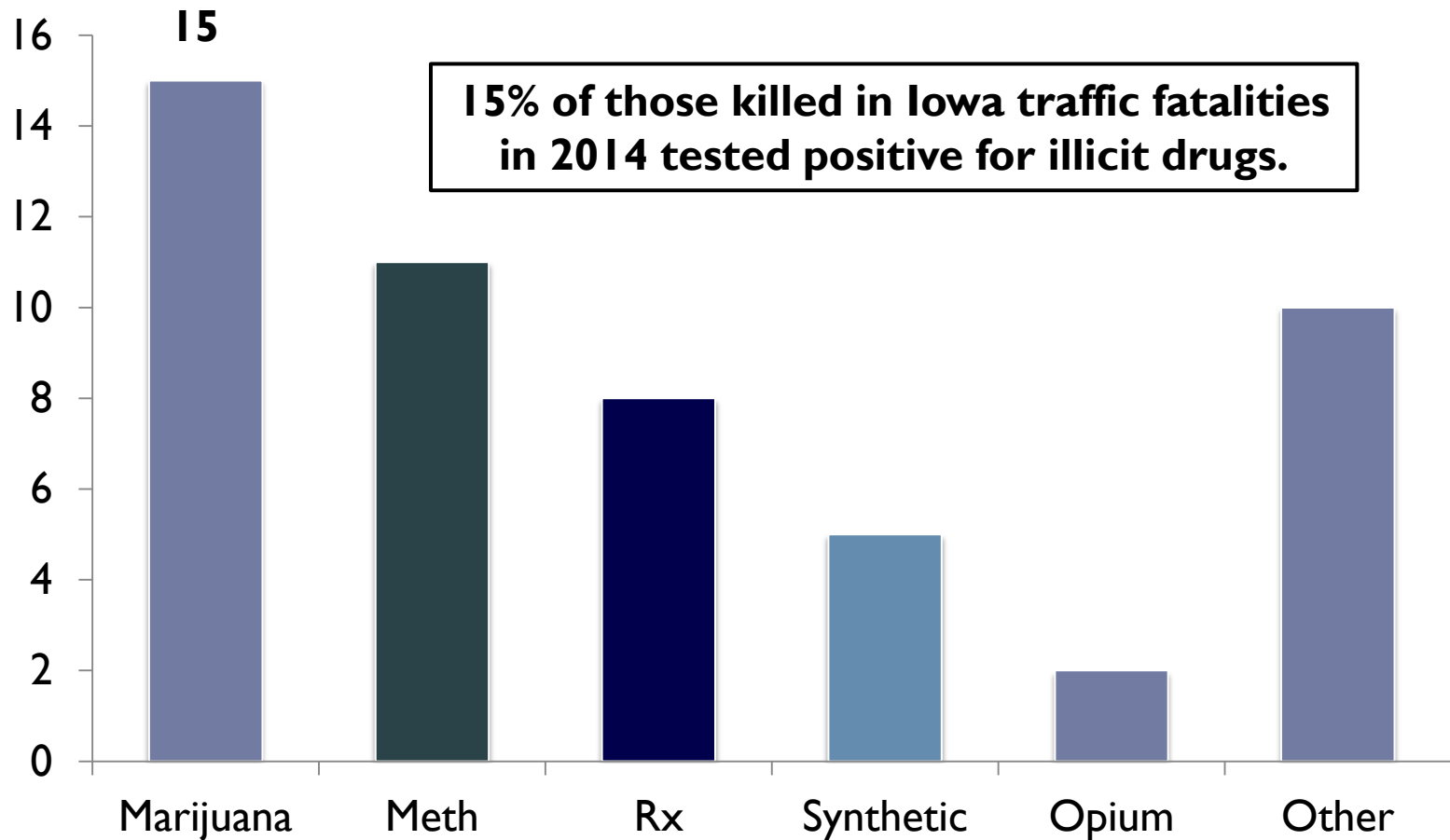
2015 Non-Alcohol Evaluation Findings by Drug Recognition Experts



IDPS, 2015

Iowa Drug-Related Traffic Fatalities

Number Killed in 2014 Testing Positive for Illicit Drugs



Does not include alcohol-related fatalities.
Alcohol & poly-drug combinations were detected in some crashes.

Source: IDOT, 2014

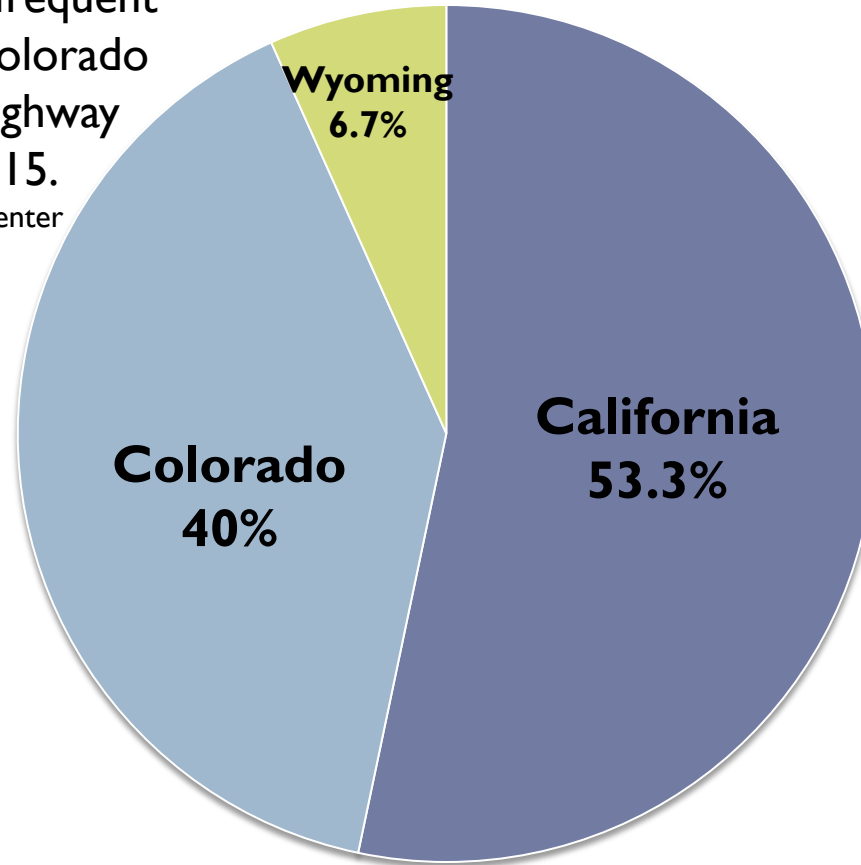


Source of Marijuana Seized in Iowa

2015 Iowa State Patrol Significant Highway Interdictions

Iowa was the 4th most frequent state destination for Colorado marijuana seized in highway interdictions in 2015.

2016 El Paso Intelligence Center



Iowa Department of Public Safety, 2015

Marijuana Case Studies

Diversion (Leakage)

- Highway Patrol yearly interdiction seizures of Colorado marijuana increased 37% since Colorado legalization (288 in 2013 vs. 394 in 2015). Of 36 different destination states in 2015, the most common were Missouri, Illinois, Texas, Iowa & Florida.

2016 El Paso Intelligence Center, U.S. Drug Enforcement Administration

- Seizures of packages containing Colorado marijuana in the U.S. mail increased 427% in the 3 years “recreational” marijuana has been legal (average of 70 parcels 2010-2012 vs. 369 parcels 2013-2015). The amount of marijuana seized in these packages increased 471% (average of 129 pounds 2010-2012 vs. 736 pounds 2013-2015).

2016 U.S. Postal Inspection Service

- The #1 complaint of Denver convention & leisure visitors (49%) is downtown environment: homelessness, youth, panhandling, safety, cleanliness & drugs.

2014 Visit Denver Survey

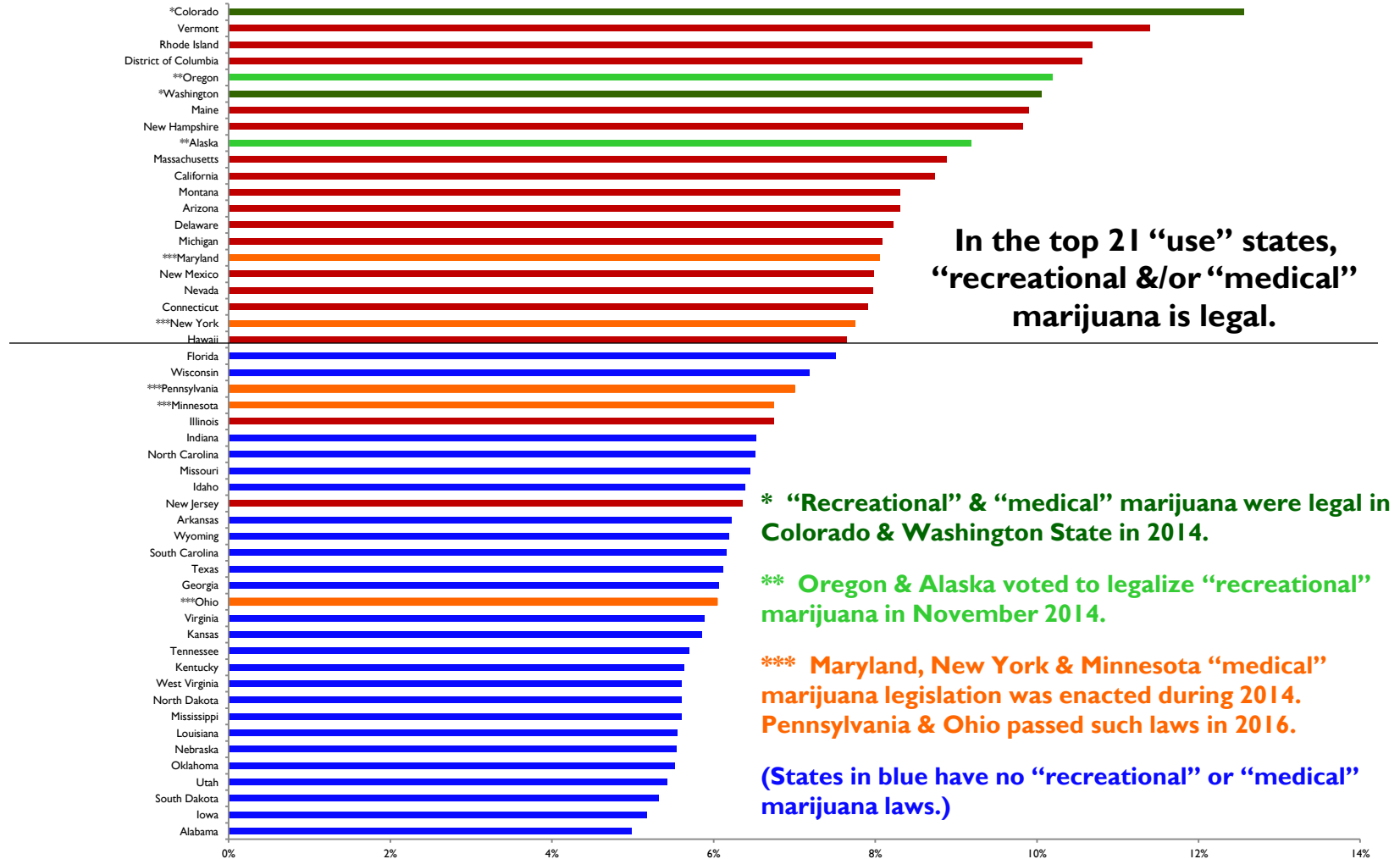
Marijuana Case Studies

Use/Abuse

- “Medical” marijuana laws do not increase adolescent marijuana use, but adolescent use is higher in “medical” marijuana states.
2015 Hasin, Wall, Keyes, Cerda, et al., Lancet
- “Medical” cannabis laws amplify recreational juvenile cannabis use by allaying social stigma & placating fear that cannabis use could potentially result in a negative health outcome.
2015 Stolzenberg, D'Alessio & Dariano, International Journal of Drug Policy
- College students' use of marijuana continues a decade-long increase, even as the abuse of many other substances declines. 38% of college students reported using marijuana in 2015, up from 30% in 2006. 2016 Monitoring the Future Survey/University of Michigan
- The top 21 states (& DC) for current marijuana use among teens all have approved “medical” marijuana. 2013-2014 National Survey on Drug Use & Health

Current Youth Marijuana Use Rates

Age 12-17 in “Medical” vs. Non-“Medical” Marijuana States



2013-2014 National Survey on Drug Use & Health

Marijuana Case Studies

Impact on Youth

- Current Colorado youth marijuana use increased an average of 20% in 2 years of legalization (2013/2014), compared to a 4% decline nationally. 2013-2014 National Survey on Drug Use & Health
- Current marijuana use in Colorado during the 2 years “recreational” marijuana has been legal (2013-2014) increased an average of 17% among college-aged residents & 63% among adults vs. the 2-year average before legalization.
2013-2014 National Survey on Drug Use & Health
- Marijuana use in the 1st year of college can lead to students skipping classes, lower grades & later graduation.
2015 University of Maryland School of Public Health, College Life Study
- 77% of American teens now believe smoking pot is safe.
2014 Behavioral Health Barometer, U.S. Substance Abuse & Mental Health Services Administration

Marijuana Case Studies

Impact on Youth

- Persistent marijuana use during adolescence can cause a long-term 8-point drop in IQ, & harm attention span & memory.
2012 National Academy of Sciences, Dunedin Study
 - 62% of all Colorado public school drug expulsions & suspensions were for marijuana violations. 2015-2016 Colorado Department of Education
 - 82% of Colorado School Resource Officers report an increase in marijuana-related incidents since legalization. 45% said students got marijuana from friends who obtained it legally, 24% said black market, 22% said parents & 9% said stores or dispensaries.
2016 Colorado Association of School Resource Officers Survey
 - A small amount of secondhand marijuana smoke may damage blood vessels, according to a study of rats with arteries similar to humans. Vessels took at least 3 times longer to recover after a minute of secondhand marijuana smoke vs. tobacco smoke.
2016 American Heart Association
-

Marijuana Case Studies

Impact on Youth

- The average rate of marijuana-related children's hospital visits in Colorado nearly doubled from 1.2/100,000 population 2 years prior to legalization vs. 2.3/100,000 2 years afterward.
2016 University of Colorado, JAMA Pediatrics
- Regional Poison Center pediatric marijuana cases in Colorado increased more than 5-fold from 9 in 2009 to 47 in 2015. Many exposure cases involved marijuana-infused edible products.
2016 University of Colorado, JAMA Pediatrics
- States decriminalizing marijuana saw a 30+% increase in poison center call rates for children requiring medical intervention from 2005-2011 vs. no change in other states. 2014 Annals of Emergency Medicine
- 1 in 6 infants & toddlers admitted to a Colorado hospital with coughing, wheezing & other symptoms of bronchiolitis tested positive for marijuana exposure. 2016 American Academy of Pediatrics

Marijuana Case Studies

Impact on Youth

- Marijuana exposure rates among children 5 & under increased 16%/year after legalization in affected states, & child exposures rose 147% from 2006-2013. 2015 National Poison Database System, Clinical Pediatrics Journal
- From 2013-2014, marijuana-related poison calls increased 50% in Washington State. Calls involving children nearly doubled.
2015 Washington Poison Center
- Since legalization in Washington State in 2012, poison center calls related to THC-infused products increased 312.5% & calls related to marijuana oil increased 850% over the course of 3 years.
2016 Northwest High Intensity Drug Trafficking Area, Washington State Poison Center
- Marijuana was involved in 98% of 2013-2014 Seattle Public School student drug violations, plus 48% of Washington State student expulsions & 42% of suspensions.
2016 Northwest High Intensity Drug Trafficking Area

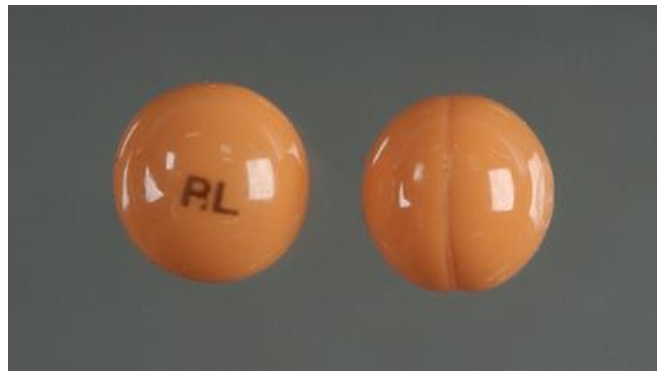
Marijuana Case Studies

Other Impacts

- Marijuana-related traffic deaths in Colorado increased an average of 48% since legalization (2013-2015).
2015 Colorado Department of Transportation
- As of January 2016, Colorado had 424 retail marijuana stores statewide, compared to 322 Starbucks and 202 McDonald's.
2016 Rocky Mountain High Intensity Drug Trafficking Area
- 68% of Colorado's local jurisdictions have banned "medical" & "recreational" marijuana businesses. 2016 Rocky Mountain High Intensity Drug Trafficking Area
- Some marijuana potency values have been surprising strong, close to 30% THC, while many samples have little or no CBD.
2015 American Chemical Society/Charas Scientific Labs of Colorado
- People who abuse or are dependent on marijuana are 3 times more likely to abuse or be dependent on heroin. 2015 Centers for Disease Control

“Medical” Marijuana: Alternatives

- Research shows a few orally-administered synthetic medicines containing the cannabis plant’s principal psychoactive compound tetrahydrocannabinol (THC) do have therapeutic potential to relieve pain, control nausea, stimulate appetite & decrease ocular pressure. Smoking or ingesting crude marijuana is not required.



- Dronabinol (Marinol) & Nabilone (Cesamet) are FDA-approved & legally available as prescription pills.

“Medical” Marijuana: Alternatives

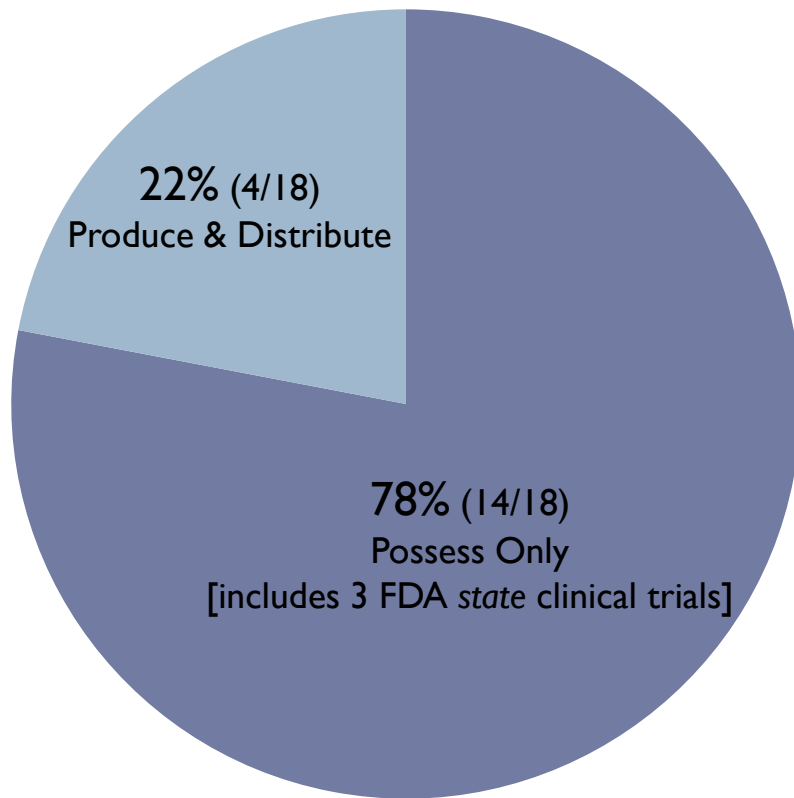
- A mouth spray (Sativex) with 2 cannabinoids extracted from the cannabis plant failed FDA-authorized tests for cancer pain, but may be tested on spasticity problems.
- An oral liquid (Epidiolex) containing the non-psychoactive & nearly pure cannabis extract Cannabidiol (CBD) is an FDA orphan drug in a fast-track study in Iowa & elsewhere to treat severe seizures. Initial clinical trial results are encouraging & if all goes well an Rx product could be on the market in early 2018.
- 18 states, including Iowa, now permit limited use of CBD solutions by patients with severe medical needs.



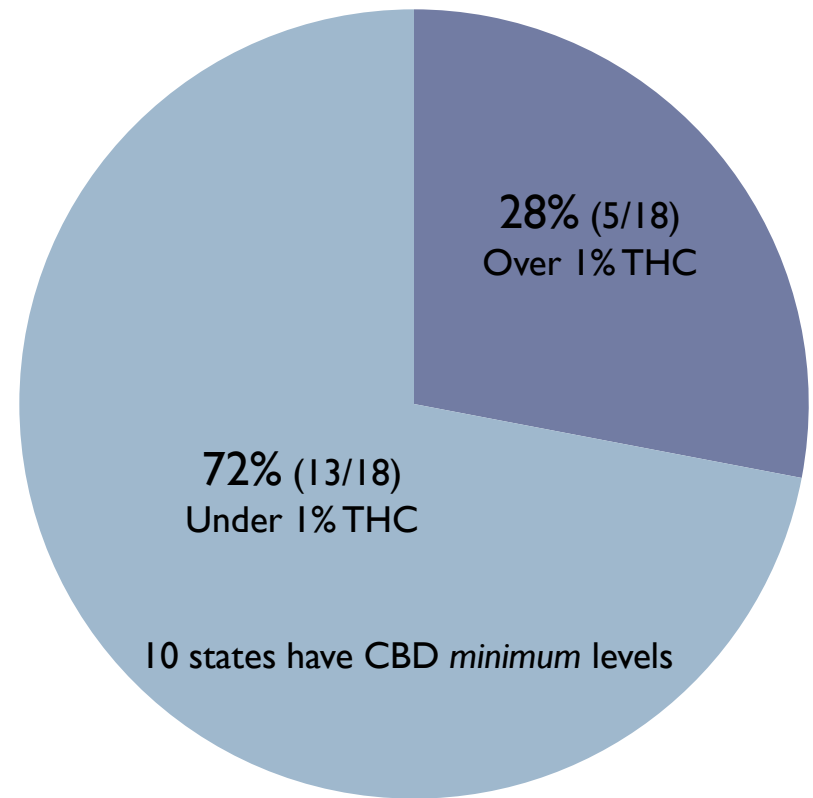
CBD Laws in 18 States

Differences in Scope

Production & Distribution vs. Possession Only



THC Levels: Under 1% vs. Over 1%



National Alliance for Model State Drug Laws, 2016

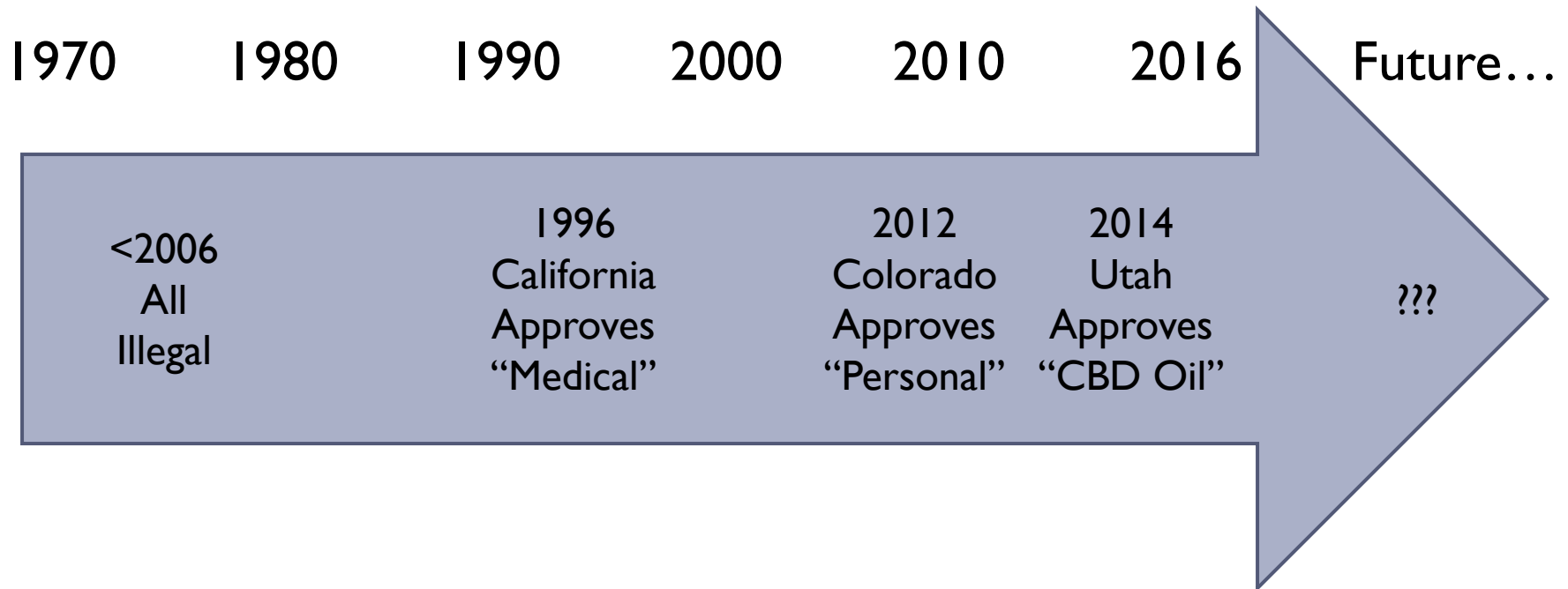
“Medical” Marijuana: Research

- A systematic review & meta-analysis found most uses of “medical” marijuana would not pass FDA review due to a lack of reliable evidence to support the drug’s use. June 2015 Journal of the American Medical Association
- 14 of 24 “medical” marijuana programs were essentially nonmedical in practice, but enrolled over 99% of all participants, mostly in western states with fewer regulations. 2016 Columbia University Medical Center
- 58% of respondents to a poll about prescription drug availability & cost opposed changing the government’s approval standards to make drug reviews quicker. 2016 National STAT-Harvard School of Public Health
- Adults who use marijuana are 5 times more likely to develop an alcohol use disorder. 2016 Columbia University’s Mailman School of Public Health & City University of New York
- Using marijuana & alcohol together impacts driving more than using either substance alone. 2015 National Institute on Drug Abuse

“Medical” Marijuana: Research

- NIH invested \$111 million in 281 cannabinoid research projects in fiscal 2015, including 49 (\$21m) to examine potential therapeutic properties of cannabinoids & 15 (\$9m) on CBD. This is in addition to 17 independently funded research projects approved since 1999 to study possible therapeutic uses of marijuana/derivatives.
- The DEA says the number of authorized researchers is growing. 399 active researchers were registered as of June 2015 to study Schedule I controlled substances. Of these, 265 were studying marijuana & extracts, including CBD (41 with human subjects).
- The U.S. Senate Drug Caucus held a hearing in 2015 to lower CBD research barriers & said the U.S. Justice Department would analyze CBD for potential medical benefits. The Administration also removed an extra federal research requirement.

U.S. Marijuana Policy Continuum



Changing Attitudes: Quest & compassion for therapy, financial incentives, social justice, privacy concerns, social media/internet, etc.?

Critical Considerations: Medical efficacy, research outcomes, public safety & holistic policy!



What's Next?

- Clear the language clutter & confusion.
- Skepticism can be healthy (“How do you know?”).
- Scientifically vet non-psychoactive CBD for medical possibilities.
- Psychoactive marijuana (mind-altering THC) is another matter.
- Include public safety in the conversation.
- #1 question: “Is it good for Iowa kids?”
- Accelerate research, heighten education & foster understanding.

Share the News & Stay Safe!

Iowa Office of Drug Control Policy
Visit Our New Website: <https://odcp.iowa.gov>

